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ABSTRACT

Two specific questions were addressed in the study: (1) Do student teachers from randomly selected in-center situations verbally interact with students differently than randomly-selected non-center student teachers? and (2) Do center student teachers have concerns that are different from those of non-center student teachers? Data was gathered from the Teachers Concerns Checklist and the Sixteen Personality Factor Questionnaire completed by both groups of student teachers. Non-center student teachers were placed in metropolitan school settings with no enrichment program input from the university. The teacher education center student teachers participated in a program consisting of: (1) content seminars on discipline, reinforcement strategies, and questioning techniques; (2) an orientation day to acquaint the student teacher with the center prior to the student teaching experience and to facilitate placement with the cooperating teacher; (3) analysis of their teaching through he use of audio and video tapes several times during the teaching experience; (4) individualized student teaching programs through the use of objectives that were summarized as a basis for their final evaluation; and (5) daily consideration in placing this research in perspective is the lack of a well-developed program at the teacher education center used for this research. Results indicate that in order to make a significant difference, a teacher education program needs to provide experiences that will result in behavioral changes. (MM)

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A COMPARATIVE STUDY OF THE VERBAL INTERACTION AND CONCERNS OF CENTER STUDENT TEACHERS WITH NON-CENTER STUDENT TEACHERS

by

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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I

BACKGROUND AND PROBLEM STATEMENT

Rationale for this Study

Teacher centering is one of the fastest growing innovations on the educational scene today (Schmieder & Yarger, 1974). It has been estimated that it usually takes over twenty years for a new concept to be accepted. Although Centers have been in operation for ten years in sections of our country such as the midwest, the Teacher Education Center has essentially entered the mainstream of educational thought and practice in less than five years (Schmieder & Yarger, 1974). The implementation of competency-based programs has encouraged the development of centers by colleges and universities.

Since Teacher Education Centers are a national trend in education it behooves educators to investigate the question of their effectiveness. Furthermore, the claims advanced to support the center concept lack the backing of a sound body of research.

Among the claims offered in support of the center concept are those maintaining that the center: is a place and a vehicle for designing, facilitating and promoting desired changes in education (Collins, 1972); is a mechanism for the sharing of the responsibility and the accountability for improving teacher education (Collins, 1970); offers improved preservice and inservice education through a unified approach to both (Collins, 1972; Smith, E. B., 1975). These claims for centers are being made with very little research, particularly experimental research, to support them.

The current literature provides little data on which to make decisions as to the effect of centers upon teacher education. It focuses almost exclusively on such issues as goals, organizational

structure, sovereignty, staffing and funding. Few attempts have been made to provide empirical data comparing the effectiveness of Teacher Education Centers with traditional programs concerning the preparation of competent professional educators.

The question that as yet remains to be answered is whether or not centers make a positive difference in preservice teacher education. This research addressed this problem.

Problem Statement

The purpose of this study was to investigate the problem of whether or not centers make a difference in the student teacher competency of preservice teacher education. More specifically, the questions addressed were:

1. Do center student teachers from randomly-selected incenter situations verbally interact with students differently than randomly-selected noncenter student teachers?

2. Do center student teachers have concerns that are different from those of noncenter student teachers?

Discussion of the Problem Statement

In narrowing down the problem of which factors to assess in determining whether or not centers make a difference in teacher preparation, several dimensions were considered. While the whole question of the effectiveness of the inservice component of a Teacher Education Center is important to determine, the decision was made to evaluate the behavior of preservice personnel only. There were several reasons for this. Firstly, the development of centers in the metropolitan area where this research was implemented has focused on preservice education. Secondly, the evaluation of centers as vehicles

for preservice education continues to be of current concern to the faculties of the many colleges and universities whose programs are implemented in centers.

The issue of the attitude of center student teachers toward the student teaching experience as compared with noncenter student teachers has been investigated in a very few studies, only two of which were both large scale studies and experimental in nature (Collins, 1970; Teacher Education Center Self Study, 1975.) And while evidence concerning attitudes may be very supportive of the Center concept, realistically, it is data on the analysis of teaching behavior and teacher growth that will clarify the acceptability of the center concept.

For this reason the decision was made to investigate teacher behavior using the following: (a) an instrument to measure the verbal interaction between student teachers and their students, and (b) an instrument to measure the concerns of student teachers using an experimental (center) and a control (noncenter) group.

Interaction analysis instruments have been widely used to obtain research data about instruction (Travers, 1973; Simon & Boyer, 1970). The Collins study on centers used the Flanders instrument to analyze teacher-student interaction. The interpretations of the evidence demonstrated that student teachers in centers teach differently (with statistical significance) than do those in noncenter situations (Collins, 1970), but additional evidence needs to be gathered. The Interaction Analysis for Science Teachers (IAST), was selected to obtain teacher-student interaction data for this research.

The concerns of center student teachers as a group have been studied in only one investigation in process while this particular research was being designed. The conceptualization of teacher concerns, an area somewhat related to attitudes, is a relatively new dimension of the study of teaching. An instrument to measure teacher concerns, the Teacher Concerns Checklist (TCC), has been refined and validated sufficiently for research and was therefore selected as a measure of teacher growth conceptualized in terms of concerns (George, 1974).

Recognizing that research has indicated a significant relationship between the clinical assessment of teaching personality and the problems reported by student teacners and with their teaching behavior (Fuller and Peck, 1974), it was decided to have the subjects take the Sixteen Personality Factor Questionnaire. The data from this test were correlated with that from the use of the two major instruments, the Interaction Analysis for Science Teachers and the Teacher Concerns Checklist.

To summarize, building on previous research, the purpose of this study was to investigate the question of whether or not teacher centers make a positive difference in preparing student teachers. To do this, data were collected on the student-teacher verbal interaction, concerns and personality of center student teachers in comparison with noncenter student teachers. A listing of the specific hypotheses tested has been included at the end of this paper for reference (Appendix).

Limitations

This study was conducted within the following recognized limitations:

1. The data were collected over a time period of only one quarter using one group of student teachers.

2. During the time the experimental group was student teaching, those Center subjects who had not yet taken ECI 343, the Elementary

School Curriculum, were taking this course blocked with their student teaching. The problem of identifying if and to what degree this course may have contributed to any changes measured by the instruments used in this study was a recognized concern.

3. The Center Coordinator where this research was implemented was also the experimenter in this study. The Coordinator did attempt to minimize the effect of the research by not discussing the existence of or the nature of the experiment with the center student teachers.

4. The findings of this study may be limited to centers similar to the one in which this research was carried out.

5. The measures were obtained during the last few weeks of the school year before the summer recess.

6. The persons were trained to code the audio tapes using the IAST as part of a project for a course taken at the urban University where this research was implemented. This arrangement did not allow for the amount of time and work needed to achieve a more acceptable estimate of observer reliability with an interaction analysis system that is as complex as the IAST.

Summary of the Need for the Study

Claims have been made for the teacher education concept as a vehicle for educational improvement. Centers are operating across the U. S. based upon this assumption. Yet very little research in general, and only two major experimental studies in particular, have been conducted to support this assumption.

The need to investigate experimentally whether or not centers are making a difference in preservice teacher education is obvious. This research addressed this problem.

II

RESEARCH METHODOLOGY

Description of the Population and the Sampling Procedures

This research was conducted using the education majors who student taught during the spring quarter of 1975 at a large metropolitan university. On the undergraduate level, this population consisted of Elementary, Early Childhood, and Educable Mentally Retarded majors; on the graduate level, it included students working toward certification or a Masters degree in Special Education or Elementary Education.

Randomized assignments of the subjects to both the experimental and control groups was accomplished prior to the spring quarter during which this research was carried out. Initially, the experimental and control groups consisted of twenty-two subjects each. Unanticipated complications reduced the number of subjects to fourteen within each group. A discussion of the power estimates as a function of sample size is included in the section on research findings.

The experimental group was then assigned to one Teacher Education Center by the Director of Field Experiences at the urban university sponsoring this research. The control group members were assigned to placements in the metropolitan area other than in a center.

Treatment of the Experimental Group

The treatment of the experimental group placed at the Rusk Teacher Education Center was the program as directed by the Center Coordinator and implemented by her with the assistance of the center cooperating teachers.

More specifically, this program consisted of a series of content seminars directed by the Coordinator on the following topics: discipline, reinforcement strategies, and questioning techniques. An Orientation Day program prior to the beginning of the quarter was used

to acquaint the student teachers with the center so as to facilitate their placement with a cooperating teacher. The student teachers also analyzed their teaching through the use of audio and video tapes several times during the quarter. They individualized their student teaching programs through the use of objectives which were summarized as a basis for evaluation at the completion of the quarter. Throughout the quarter, the center coordinator was present on a daily basis to supervise and counsel the student teachers and work with the cooperating teachers in supervision.

Treatment for the Non-Center Student Teachers

Since the non-center group was randomly selected, it was expected that their experiences were representative of those that most student teachers have during student teaching. The control group subjects were placed in non-center situations without any input into their programs for the quarter.

These student teachers were supervised by a variety of professors and graduate teaching assistants from the several departments within the School of Education at the urban university sponsoring this research. The nature of the college-related experiences associated with these assignments varied from minimal supervision to weekly seminars with the college supervisors.

The functions of these seminars were almost exclusively to allow the discussion of concerns among a group of student teachers supervised by one college supervisor and to clarify the logistics of that supervisor's requirements for student teaching. The seminars did not focus on a content or skill area such as discipline or questioning techniques as did the center seminars.

Notification of the Experimental and Control Groups

The experimental group was notified about four weeks prior to the end of the quarter that they needed to make an audio-tape for use in this research, and that they would be required to take the Teacher Concerns Checklist and Sixteen Personality Factor Questionnaire on June 2. The members of this group were told only that they were part of a study concerning centers and that the specifics of the research would be disclosed to them after the testing was completed.

At about the same time the control group members were notified of their participation in this study through a formal letter. This communication also specified the procedures for audio-taping and the date and time they were to report to take the 16-PF and the TCC. This was followed by an informal phone call to allow the experimenter feedback from the student teachers and to answer any questions which these people might have concerning their participation in the study.

The cooperation of all of the supervising teachers and the principals at the schools involved was secured prior to the data collection.

Recording the Audio-Tapes

The procedures for recording the audio-tapes were outlined in the letters mailed to the control group, and the memorandum distributed to the experimental group. All subjects were asked to audio-tape three fifteen-minute segments of their classroom teaching time on three different mornings of the week and at varying times during these mornings during the last two weeks of the quarter.

The tape cassettes were mailed to the control group members. Within the center, the Coordinator distributed the tapes to the subjects.

Coding the Tapes

Five persons were trained to code the audio-tapes using the IAST. These coders were undergraduate students taking a learning theory course at the urban university previously identified. They were selected by the experimenter from among a group from this class who volunteered to code as part of their course work.

These five students met with the experimenter for two hours twice weekly for six weeks. The training procedures used were those generally recommended for use with interaction analysis instruments; that is, the coders alternated coding and discussed their codings for the purpose of increasing inter-coder agreement in classifying what they heard on the tapes. Ten different tapes were used for training purposes because according to Winer (1971), and Hall (1972) at least this number is needed to legitimately determine the intraclass correlation coefficient which the experimenter used to calculate inter-coder reliability.

Determining Coder Reliability

When verbal behavior is coded over a period of time, it is important to determine coder stability. Coder stability is the extent to which there is agreement in coding over a period of time and among coders. Coder stability among several coders is called inter-coder reliability.

As recommended by Winer (1962) and Hall (1972), the intraclass correlation coefficient was used to calculate inter-coder reliability because it has been observed that as the number of categories in a system of interaction analysis increases and the pace of the lesson quickens, there is an apparent reduction in the validity of the Scott Coefficient, the customary statistic for calculating observer reliability (Flanders, 1967).

Since the coding was a partial requirement for a college course and due to the ensuing end of the quarter, it was necessary for the coders to code the actual tapes for the study prior to the final calculation of the intra-class correlation coefficient for inter-rater reliability. The results of the calculation are discussed at the end of the section on research findings.

Coding the Tapes

As soon as the subjects returned the recorded tapes to the experimenter, she randomly selected one from among the three tapes submitted by each person. These randomly-chosen tapes were then given to the coders to code using the IAST. The sheets of paper with the coded information were mailed to the Research and Development Center at Austin, Texas, where the computer cards were punched.

Testing

At 3:00 p.m., on June 2, 1975, the members of both the experimental and control groups met in a room on the campus of the urban university previously mentioned to fill out the 16-PF and Teacher Concerns Checklist. After the testing session, the experimenter answered questions raised about the nature of the study.

The experimenter scored the 16-PF and TCC tests. The data from them that were relative to the hypotheses formulated at the initiation of this study, were punched on computer cards.

Data Analysis

The initial analysis at the IAST data was performed at the Research and Development Center at the University of Texas at Austin since the program for scording the system was already on the computer there where

it was developed. The computer sheets with the matrices for the subject and the groups as well as the ratio and frequency tallies needed to test the hypotheses were returned to the experimenter.

The remainder of the data analysis involved the use of the computer facilities at the metropolitan university sponsoring the research. Two statistical techniques were applied to test the hypotheses: analysis of variance and correlation.

A fixed effects profile analysis of variance design was used with one between subjects factor (treatment condition) and one within subjects factor (test item type). The specific computer program used was ANOVRM, an analysis of variance for repeated measures. This analysis was run three times: once with the IAST ratio data; again with the IAST frequency tallies; and finally, with the TCC scores.

Had significance been indicated by this procedure, the Geisser and Greenhouse Univariate Conservative F Test (1958) would have been used as described in Cairo (1973) to correct for possible inter-dependence among the dependent measures and violation of the assumption of homogeneity of variance.

The scores from the TCC and the IAST were correlated with the 16-PF factors. The computer program used for this correlation was the BMDO3D which printed out a correlation matrix for the subjects in the experimental and control groups combined.

III

REPORT OF RESEARCH FINDINGS

General Results from the Profile Analysis of Variance

An analysis of variance showed that the between subjects factor (Center treatment) did not have an overalll significant effect ($p > .05$) as measured by either the Interaction Analysis for Science Teachers or the Teacher Concerns Checklist. The F values computed for the between subjects factors were as follows: .34 for the IAST ratio data (Table I); 1.04 for the IAST frequency data (Table 2); and .43 for the TCC (Table 3).

No significant differences were found in the interaction effects between treatment and test types in any of the analyses of variance. The F ratios computed for the interactions were for the IAST ratio data, .25 (Table 1), for the IAST frequency data, 2.07 (Table 2), and for the TCC, 1.28 (Table 3). This indicated that the treatment did not produce significant changes in the experimental group on any of the tests.

General Results of the Inter-Correlation

A correlation among the sixteen personality factors as measured by the Sixteen Personality Factor Questionnaire with the primary tactics, the levels of questioning, the flexibility ratio and the indirect/direct teaching ratio (from the IAST) and the three concerns (from the TCC) resulted in no significance ($p > .05$). Based upon these results, it was concluded that: (a) there was no relationship between the concerns expressed by teachers as measured by the TCC and the personality factors according to the 16-PF; (b) there was no relationship between the concerns of student teachers and their teaching behavior as measured by the IAST instrument and; (c) there was no relationship between the

Table I

Univariate Analysis of Variance

IAST Ratio Data

Source	df	MS	F
Between Subjects			
Center Treatment (A)	1	30.85	.34
Error	26	88.70	
Within Subjects			
Test Type (T)	5	931.11	11.01
Treatment and Test Type (AT)	5	21.22	.26
Error	130	84.55	

Table 2

Univariate Analysis of Variance

IAST Frequency Data

Source	df	MS	F
Between Subjects			
Center Treatment (A)	1	1195.18	1.04
Error	26	1145.32	
Within Subjects			
Test Type (T)	6	48809.20	43.29
Treatment and Test Type (AT)	6	2334.91	2.07
Error	156	1127.27	

Table 3

Univariate Analysis of Variance

Teacher Concerns Checklist Data

Source	df	MS	F
Between Subjects			
Center Treatment (A)	1	141.44	.43
Error	26	328.48	
Within Subjects			
Test Type (T)	2	49236.22	510.16
Treatment and Test Type (AT)	2	96.51	1.28
Error	52	74.90	

personality factors of teachers and their teaching behavior as tested by 16-PF and the IAST.

Power was calculated using the tables for statistical analysis by Cohen (1969). For the large effect, the power estimate for the treatment factor was approximately .78. While is lower than would be desired, comparable estimates are not unique to educational studies.

Inter-Coder Reliability

Since it was recognized that the validity of the Scott coefficient commonly used to estimate inter-coder reliability decreases as the pace of a lesson quickens and the number of categories in a system increases, the intraclass correlation was calculated. This was a category-by-category analysis for each of the five coders across ten minutes of the same ten tapes. The resulting coefficients are listed in Table 4. A coefficient value of .50 or greater is generally considered to be acceptable.

While the incidence of a low coefficient can indicate the low incidence of a category on the tapes coded, this assumption is not completely supported by the experimenter's evaluation of the tapes used for training the coders. The conclusion is that in some of the categories such as 4 and 9, which had high incidence, the low coefficients must be the result of low coder reliability. In other categories, such as 1, 2 and 7, the assumption that a low correlation coefficient is due to the low incidence of that category is warranted by an analysis of the tapes used to compute the estimate.

Since the procedures outlined in the IAST Manual for training coders in developing a common frame of reference were carefully followed (Hall, 1972), the explanation of the low estimate of coder stability lies in the

Table 4

Observer Reliability Coefficients

For the Intraclass Correlation

Category	Coefficient
1. Accepts feelings	.00
2. Praise	.00
3. Accepts students' statements	.27
4. Question	.07
5. Direction	.61
6. Provide substantive information	.50
7. Criticizes or rejects student's behavior	.25
8. Teacher controlled silence	.41
9. Student statement	.40
10. Student questions	.30
11. Affective response	.53
12. Student activity	.52
13. Division of student-to-student interaction	.72
14. Nonfunctional behavior	.65

amount of time allotted for training the coders. Since these persons were coding as a project requirement for an undergraduate course, the amount of time necessary for developing a common frame of reference exceeded that available within the constraints set up for coder training.

Summary of Findings

Results from the repeated measures analysis of variance for each of the test types yielded statistically insignificant differences between the experimental and control groups. The inter-correlations among the measures did not result in significant correlation coefficients.

IV

DISCUSSION AND IMPLICATIONS

Discussion of the Limitations Affecting the Lack of Significance

The lack of statistically significant findings based upon the typotheses tested must be cautiously interpreted in light of the limitations imposed by several conditions. These limitations are generally of several kinds relating to the following: research methodology, the sociology of the schools and the current research problem of identifying differences in centers.

Research Methodology

Limitations Related to Low Power Estimates

With regard to research methodology, the initial qualification is the low power estimate, a function of reduction in sample size to twenty-eight subjects due to uncontrollable factors. Change would be difficult to detect under these circumstances due to the probability of making a Type 1 error, that is, not rejecting a null hypothesis that is really false. Real differences may not have been detected. However, low power estimates are not uncommon in educational research.

Low Coder Stability

A second factor related to research methodology was the low estimates of intercoder reliability. The training of students to code as part of a project for an undergraduate course has severe limitations with an interaction analysis system as complicated as the IAST, v. 2. The problem of developing a common frame of reference is multiplied with increases in the amount of categories in a system, the number of coders and the frequency of transitions in the tapes coded. Developing coder reliability with the IAST requires a situation unlimited by time constraints.

Research in the Classroom

Another research limitation involves the necessity of using the classrooms of a public school system for research. While such a setting provides the most realistic situation for the study of teaching, control of the variables is limited by the need to avoid disruption of normal procedure. The need to tape the classroom teaching of the student teachers as close to the end of the quarter as possible to maximize their time for growth resulted in taping some artificially arranged situations. Classroom routines had been relaxed for end-of-the-year activities, students were hyperactive and teachers' patience limited.

Test Scoring, Reliability and Validity

Hand scoring the 16-PF and the TCC may have reduced the reliability of the measures. Furthermore, despite extensive reliability studies with the 16-PF, the authors urge care in relying upon the results of one test to measure personality. And while reliability estimates calculated for the purposes of this research were comparable to those of the test developers confirming reliance upon the stability of the test, use of several forms of the 16-PF might have resulted in increased response reliability.

The concept validity of the 16-PF has been cross-validated in extensive studies with different adult population samples (Manual for 16-PF). Validity studies for the TCC, however, have been carried out with only a few population samples and additional validation studies are currently in progress. Intercorrelations using the subjects in this study resulted in coefficients that were considerably higher than those reported by the TCC authors. This was interpreted to mean that a pattern of concerns expressed was difficult to discern because

whenever a student teacher expressed a concern, he or she tended to do so in two or even three of the categories rather than only one. Confirming this, Fuller (the author of the Concerns Theory) observed the tendency of teachers to express concern over whatever situation was suggested to them (Fuller, Parsons & Watkins, 1969).

To summarize, test results may be questioned due to: hand-scoring, test reliability using the 16-PF; the need to improve the concept validity of the TCC.

Identifying Center Differences

The lack of significance on any of the measures reported previously could also be due to the types of tests used to measure change. The measures used may not have adequately reflected the changes that were made in the experimental group.

This is especially true of research on centers because the potential sources of effects within centers have not been accurately identified and could be attributable to several interactive phenomena as the literature illustrates (TECSS, 1975). Indeed, considering the paucity of studies on centers and the complex center makeup, the few significant differences reported in the literature are remarkable (TECSS, 1975; Collins, 1972).

Sociology of the Schools

Several other limitations which may have influenced the insignificance found in this study relate to the sociological makeup of the schools involved. The failure to measure more flexibility, indirectness, open questions and concern for pupils among the center student teachers as compared with their noncenter counterparts could be related to the complex sociological nature of the public schools where the experimental group was placed.

Teachers within this school system have been assigned to schools according to a court-ordered racial ratio and students attend either their neighborhood school or a school of their choice where they would be a part of the racial minority. The racial makeup of the student body of the Center schools were from low income families. By contrast, the control group students taught in suburban, white, middle class neighborhoods. It could be argued that the Center student teachers were reflecting some of the concerns and teaching styles and strategies of their cooperating teachers specific to both urban schools in general and to a specific metropolitan school system in particular.

Lack of a Well-Developed Center Program

One final consideration in placing this research in perspective is the lack of a well-developed program at the Teacher Education Center used for this research. To make a real difference, a teacher education program needs to provide experiences that will result in behavioral changes.

The program currently provided at the center needs to be expanded to include more clinical evaluation of teaching techniques by trained cooperating teachers. Such a program can best be based upon decisions made about which teaching competencies should be achieved by the student teachers who are graduating from the university placing students in that center. Direction and program-decisions based on that identification of direction are needed to clarify program definition within the center. This research may have been directed at measuring effects that could only result from a richer center program in terms of experiences provided for the student teachers.

Additional Discussion of Data

Several trends within the data were not apparent as a result of the analysis relevant to hypothesis-testing. As mentioned previously the F value for the analysis of variance computed on the frequency data for the interaction between treatment of test type and the means demonstrate that in some categories of teaching behaviors there was more indirect behavior within the experimental group than in the control group. While recognizing that these could be random events and should be tentatively accepted, they are consistent with previous center research (Collins, 1972).

Further investigation of the IAST matrices of both groups provokes some interesting questions. The tally on the teacher-to-teacher transition category was higher for the control group (1637 to 1907) but the control group's tally for the student-to-student continuation block was twice that of the experimental group (614 to 1240). When the higher control group's teacher-acceptance-of-student-statement tally (507 to 699) is viewed in the light of this huge difference in the amount of student talk, it makes the control group's apparent indirectness as concluded seem much less certain. It would appear easier to score a higher frequency in the acceptance-of-student-statement category when there are twice as many student statements to accept.

The question becomes, did the style of the noncenter student teachers elicit more student responses or could the double verbal output by students of the control group be a function of the socio-economic makeup of those schools within middle class suburban neighborhoods. There is research, supporting the latter explanation,

which indicates that students in inner-city schools talk less and require different disciplinary tactics than suburban students (Henderson, 1967). Continued analysis of the IAST printouts revealed a greater use of teacher management techniques by the experimental group in this study, which is also consistent with the literature.

Finally, the teacher talk/student talk ratio (2.68 to 1.82) indicates more acceptance of student behavior by the experimental group in terms of category one, which represents teacher recognition of and identification with the feelings of students. If students were less verbal but teachers accepting, it would be logical to expect exactly what the center data indicated: less teacher acceptance of student statements but a large tally of positive, affective teacher responses.

To summarize this analysis of the IAST data, the tests of statistical significance supported the conclusion that the noncenter group was more indirect, used more open questions and accepted more student responses than the experimental group. Further study of the printouts, however, viewed in light of the research on student behavior vis-a-vis the socioeconomic nature of the neighborhoods of the schools, makes such a conclusion appear less clear.

Implications for Future Research

Based upon previous research as well as the limitations of the research methodology, the concerns related to identification of center differences and the sociological nature of schools as discussed relevant to this study, the following suggestions are offered for future investigation:

1. To eliminate the confounding factors related to inner-city schools, balance the placement of student teachers in inner-city and suburban schools within the experimental and control groups.

An alternative would be to use four groups placing an experimental and a control section in both inner-city and suburban settings.

A corollary to this is the need to carefully define the criteria by which inner-city and suburban schools are identified.

2. Use a larger sample to increase power.

3. Collect data during the Fall and Winter Quarters to eliminate the problems attendant to collecting data in a classroom during the last weeks of a school year.

4. Train coders within a situational framework that permits the attainment of acceptable coder reliability. This would require postponing coding until adequate reliability coefficients have been estimated.

5. Continue to use the Interaction Analysis for Science Teachers. The low coder reliability estimates calculated for this study and the statistically significant findings in previous research using an interaction analysis system to measure change (Collins, 1972) warrants replication of this aspect of the study.

6. Suspend attempts to measure center effects using the Teacher Concerns Checklist. This suggestion is based on evaluation of the validity questions involved in the development of the instrument and the lack of significant results using the TCC in the recent Maryland study (TECSS, 1975).

7. While this study was designed with an awareness of the importance of the role of the cooperating teacher during student teaching, the decision was made to focus this research on measuring changes in student teachers only. Investigation of the role of the cooperating teacher and its relationship to the student teachers within centers could provide valuable information concerning any differences

centers might make in teacher education.

8. The insignificant results obtained in this study suggest the need to approach center research with caution both through formative evaluation of what is happening in centers as well as through the use of conceptual models for research and teaching. Analyses of the teaching learning process upon which formative evaluation should be based are as important as the use of conceptual models in guiding improvements in teacher education (Gage, 1963).

One way to approach the analysis of center activity would be through the use of case studies. Careful investigation of a small number of individual student teachers might provide insight into the significance of centers that is lost in group analysis. This kind of investigation would hopefully lead to the development of paradigms or patterns of research that would guide decisions concerning which variables and the relationship among them that would provide needed research data about centers.

Implications for Teacher Education

As indicated in the previous discussion of the research findings, considering the yet underdeveloped program at the Teacher Education Center where this study was implemented and the research on centers, this study may have been attempting to measure results that did not exist. This conclusion points clearly to the need for program decisions concerning the student teaching phase of teacher education programs.

To make a difference, the student teaching experience must be structured around what research has identified as good teaching and how these competencies can be developed. An integral part of a

student teaching program is the selection and training of classroom teachers as supervisors and as models for the new professionals placed with them. The center concept offers a framework for the implementation of this training, both preservice and inservice, that appears to be making a difference in centers with more developed programs (TECSS, 1975; Collins, 1972). The center concept itself, however, must not be naively assumed to be a panacea apart from the programs it can facilitate.

A second implication for teacher education suggested by the research findings discussed in this chapter is the need to differentiate among competencies needed for inner-city teaching and those needed to function successfully in suburban schools with students from higher socio-economic classes. The higher percentage (50%) of student verbalization and less direction-giving by teachers in suburban schools (noncenter in this study) as measured by the IAST may have complicated the interpretation of the data from that instrument. The nonsignificant results may well have reflected the differences between teaching in inner-city versus suburban settings rather than center versus noncenter situations.

This not only reinforces the need to avoid a simplistic approach to an interpretation of the findings reported in this study, but also points again to a well-documented but frequently ignored need of inner-city, integrated education: to deal effectively with the problems in these schools, teachers need skills and understandings that are different from and not crucial to success in suburban schools (Ornstein, 1975) . The failure to measure a difference in the student

teachers from the Teacher Education Center used for this study may reflect a failure to address the special needs of educators in metropolitan schools in the teacher education program implemented in the center. Such an indictment should not be ignored.

A final word of caution in educational program development is warranted by the insignificant results obtained. Despite prejudice against the null hypothesis among researchers and editors (Greenwald, 1975,) acceptance of the null hypothesis can provide information as valuable as rejection when adequate research procedures have been followed. Recognizing this, the lack of a measurable difference in center effect in this study should cause educational decision-makers to pursue center development carefully. Such caution is needed at this time when public criticism of the use of educational funds is especially severe. The use of good research to guide decision-making, however, is always sound policy.

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APPENDIX

Hypotheses

Based upon a review of the literature in general and previous research on Centers and experience with Centers in particular, the experimenter chose to investigate certain hypotheses. These are stated first as general research hypotheses followed by the related statistical hypotheses stated in the null form. The level of statistical significance selected for each was .05.

1. The Center student teachers will demonstrate more indirect teaching behavior than the noncenter student teachers as measured by the IAST.

1.1 There will be no difference in the (a) indirect/direct teaching ratio; (b) the revised indirect/direct teaching ratio; and (c) the teacher talk/student talk ratio, as measured by the IAST.

1.2 There will be no difference in the (a) teacher to teacher, (b) teacher to student, (c) teacher response to student and, (d) single student continuation blocks on the interaction analysis matrix as measured by the IAST.

2. Center student teachers will demonstrate more varied and less rigid patterns of classroom interaction.

2.1 There will be no difference in the primary tactics as measured by the IAST.

2.2 There will be no difference in the flexibility ratio as measured by the IAST.

3. The questioning strategies of Center student teachers will be more open as indicated both by the kind of questions (open versus closed)

asked and by the teachers acceptance of the student response (not looking for one right answer).

3.1 There will be no difference in the levels of questions asked by the teacher as measured by the IAST.

3.2 There will be no difference in the number of tallies in the acceptance-of-student-statement category.

4. Center student teachers will demonstrate a higher level of concern than non-center student teachers.

4.1 There will be no difference in the concerns factors as measured by the Teacher Concerns Checklist.

5. There will be a positive relationship between teacher behavior and the level of teacher concern of both the Center and non-Center student teachers.

5.1 There will be no relationship between the concerns factors and the levels of questioning.

5.2 There will be no relationship between the concerns factors and the primary tactics.

5.3 There will be no relationship between the concerns factors and the direct/indirect teaching ratio.

5.4 There will be no relationship between the concerns factors and the flexibility ratio.

6. There will be a positive relationship between the 16-PF factors and the IAST and TCC scores.

6.1 There will be no relationship between the concerns factors and the 16-PF factors.

6.2 There will be no relationship between the primary tactics and the 16-PF factors.

6.3 There will be no relationship between the 16-PF and the levels of questioning.

6.4 There will be no relationship between the 16-PF and the indirect/direct teaching ratio.

6.5 There will be no relationship between the 16-PF and the flexibility ratio.